



1

# SEQUENCE LISTING

<110> TORDO, NOEL  
PERRIN, PIERRE  
JACOB, YVES  
BAHLOUL, CHOKRI

<120> CHIMERIC LYSSAVIRUS NUCLEIC ACIDS AND POLYPEPTIDES

<130> 03495-0188-00000

<140> 09/549,519

<141> 2000-04-14

<150> 60/129,501

<151> 1999-04-15

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<170> PatentIn Ver. 2.1

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34

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23

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oligonucleotide PVp1

<400> 3

aattctagag cgcaccat ggttcctcag gctctcctgt ttgtaccct tctggtttt 60  
ccattgtgtt ttggaagaa ttccccccc ggtcagtt 98

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 oligonucleotide PVp2

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 gatcaactga ccggggggggg aattcttccc aaaacacaat ggaaaaacca gaaggggtac 60  
 aaacaggaga gcctgaggaa ccatggtggc ggctctag 98

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 oligonucleotide EBL1p1

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 aatttcccaa tctacaccat cccggataaa atcggaccgt ggtcacctat tccg 54

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ggaattcgag caccattctg gagcttc

27

<210> 9

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<400> 9

Asp Asn Pro Ala Ser Thr Thr Asn Lys Asp Lys  
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<400> 10

Pro Gln Ala Ser Gly Val Tyr Met Gly  
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<210> 11

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Glu Arg Pro Gln Ala Ser Gly Val Tyr Met Gly Asn Leu Thr Ala Gln  
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<223> Description of Artificial Sequence: Primer

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<400> 13  
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tcgacgccgg gttatctg 78

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<212> DNA  
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adaptor

<400> 14  
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 polypeptide PV-PV

<400> 18  
 Val Leu Gly Leu Arg Leu Met Asp Gly Thr Trp Val Ser Met Gln Thr  
 1 5 10 15  
 Ser Asn Glu Thr Lys Trp Cys Pro Pro Gly Gln Leu Ile Asn Leu His  
 20 25 30  
 Asp Phe Arg Ser Asp Glu Ile Glu His Leu Val Val Glu Glu Leu Val  
 35 40 45  
 Lys Lys Arg Glu Glu Cys Leu Asp Ala Leu Glu Ser Ile  
 50 55 60

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 <223> Description of Artificial Sequence: Chimeric  
 polypeptide -PVIII

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 Ser Pro Pro Gly Gln Leu Ile Asn Leu His Asp Phe Arg Ser Asp Glu  
 1 5 10 15  
 Ile Glu His Leu Val Val Glu Glu Leu Val Lys Lys Arg Glu Glu Cys  
 20 25 30  
 Leu Asp Ala Leu Glu Ser Ile  
 35

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<223> Description of Artificial Sequence: Chimeric  
polypeptide EBL1-PV

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Val Pro Gly Met Arg Leu Met Asp Gly Ser Trp Val Ser Leu Gln Lys  
1 5 10 15

Thr Glu Ala Pro Glu Trp Cys Ser Asn Ser Pro Pro Gly Gln Leu Ile  
20 25 30

Asn Leu His Asp Phe Arg Ser Asp Glu Ile Glu His Leu Val Val Glu  
35 40 45

Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp Ala Leu Glu Ser Ile  
50 55 60

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<211> 61

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Chimeric  
polypeptide Mok-PV

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Arg Pro Gly Ile Arg Leu Phe Asp Gly Thr Trp Val Ser Phe Thr Lys  
1 5 10 15

Pro Asp Val His Val Trp Cys Thr Pro Asn Gln Leu Ile Asn Leu His  
20 25 30

Asp Phe Arg Ser Asp Glu Ile Glu His Leu Val Val Glu Glu Leu Val  
35 40 45

Lys Lys Arg Glu Glu Cys Leu Asp Ala Leu Glu Ser Ile  
50 55 60

<210> 22

<211> 61

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Chimeric  
polypeptide PV-Mok

<400> 22

Val Leu Gly Leu Arg Leu Met Asp Gly Thr Trp Val Ser Met Gln Thr  
1 5 10 15

Ser Asn Glu Thr Lys Trp Cys Pro Pro Gly Gln Leu Ile Asn Ile His  
20 25 30

Asn Asp Arg Leu Asp Glu Ile Glu His Leu Ile Val Glu Asp Ile Ile  
 35 40 45

Lys Lys Arg Glu Glu Cys Leu Asp Thr Leu Glu Thr Ile  
 50 55 60

<210> 23

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<223> Description of Artificial Sequence: Chimeric  
 polypeptide Mok-Sad

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Lys Pro Gly Ile Arg Leu Phe Asp Gly Thr Trp Val Ser Phe Thr Lys  
 1 5 10 15

Pro Asp Glu Thr Lys Trp Cys Pro Pro Asp Lys Leu Val Asn Leu His  
 20 25 30

Asp Phe Arg Ser Asp Glu Ile Glu His Leu Val Val Glu Glu Leu Val  
 35 40 45

Arg Lys Arg Glu Glu Cys Leu Asp Ala Leu Glu Ser Ile  
 50 55 60

<210> 24

<211> 524

<212> PRT

<213> Lyssavirus sp.

<220>

<223> PV

<400> 24

Met Val Pro Gln Ala Leu Leu Phe Val Pro Leu Leu Val Phe Pro Leu  
 1 5 10 15

Cys Phe Gly Lys Phe Pro Ile Tyr Thr Ile Pro Asp Lys Leu Gly Pro  
 20 25 30

Trp Ser Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Val  
 35 40 45

Val Glu Asp Glu Gly Cys Thr Asn Leu Ser Gly Phe Ser Tyr Met Glu  
 50 55 60

Leu Lys Val Gly Tyr Ile Ser Ala Ile Lys Met Asn Gly Phe Thr Cys  
 65 70 75 80

Thr Gly Val Val Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Pro Asp Ala	100	105	110
Cys Arg Ala Ala Tyr Asn Trp Lys Met Ala Gly Asp Pro Arg Tyr Glu	115	120	125
Glu Ser Leu His Asn Pro Tyr Pro Asp Tyr His Trp Leu Arg Thr Val	130	135	140
Lys Thr Thr Lys Glu Ser Leu Val Ile Ile Ser Pro Ser Val Ala Asp	145	150	155
Leu Asp Pro Tyr Asp Arg Ser Leu His Ser Arg Val Phe Pro Gly Gly	165	170	175
Asn Cys Ser Gly Val Ala Val Ser Ser Thr Tyr Cys Ser Thr Asn His	180	185	190
Asp Tyr Thr Ile Trp Met Pro Glu Asn Pro Arg Leu Gly Met Ser Cys	195	200	205
Asp Ile Phe Thr Asn Ser Arg Gly Lys Arg Ala Ser Lys Gly Ser Glu	210	215	220
Thr Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly	225	230	235
Ala Cys Lys Leu Lys Leu Cys Gly Val Leu Gly Leu Arg Leu Met Asp	245	250	255
Gly Thr Trp Val Ala Met Gln Thr Ser Asn Glu Thr Lys Trp Cys Pro	260	265	270
Pro Gly Gln Leu Val Asn Leu His Asp Phe Arg Ser Asp Glu Ile Glu	275	280	285
His Leu Val Val Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp	290	295	300
Ala Leu Glu Ser Ile Met Thr Thr Lys Ser Val Ser Phe Arg Arg Leu	305	310	315
Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile	325	330	335
Phe Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Val Arg	340	345	350
Thr Trp Asn Glu Ile Ile Pro Ser Lys Gly Cys Leu Arg Val Gly Gly	355	360	365
Arg Cys His Pro His Val Asn Gly Val Phe Phe Asn Gly Ile Ile Leu	370	375	380
Gly Pro Asp Gly Asn Val Leu Ile Pro Glu Met Gln Ser Ser Leu Leu	385	390	395
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<210> 25
<211> 524
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<213> Lyssavirus sp.
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<220>  
<223> USA7-BT

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<400> 25
Met Ile Pro Gln Ala Leu Leu Phe Val Pro Leu Leu Ile Pro Ser Leu
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Cys Leu Gly Glu Phe Pro Ile Tyr Thr Ile Pro Asp Lys Leu Gly Pro
      20                      25                      30

Trp Thr Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Val
      35                      40                      45

Ala Glu Asn Asp Gly Cys Thr Ser Leu Ser Gly Phe Ser Tyr Met Glu
      50                      55                      60

Leu Lys Val Gly Tyr Ile Ser Ala Ile Lys Val Asn Gly Phe Thr Cys
      65                      70                      75                      80

Thr Gly Val Val Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr
      85                      90                      95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Met Pro Asp Ala
      100                      105                      110

Cys Arg Ala Ala His Asp Trp Lys Met Ala Gly Asp Pro Arg Tyr Glu
      115                      120                      125

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Asp	Ser	Leu	Gln	Asn	Pro	Tyr	Pro	Asp	Tyr	His	Trp	Leu	Arg	Thr	Val	130	135	140	
Lys	Thr	Thr	Lys	Glu	Ser	Leu	Val	Ile	Ile	Ser	Pro	Ser	Val	Ala	Asp	145	150	155	160
Leu	Asp	Pro	Tyr	Asp	Lys	Ser	Leu	His	Ser	Arg	Val	Phe	Pro	Ser	Gly	165	170	175	
Lys	Cys	Leu	Gly	Ile	Thr	Val	Ser	Ser	Thr	Tyr	Cys	Ser	Thr	Asn	His	180	185	190	
Asp	Tyr	Thr	Ile	Trp	Met	Pro	Val	Glu	Pro	Arg	Leu	Gly	Thr	Ser	Cys	195	200	205	
Asp	Ile	Phe	Thr	Asn	Ser	Arg	Gly	Lys	Arg	Ala	Ser	Lys	Gly	Gly	Arg	210	215	220	
Val	Cys	Gly	Phe	Val	Asp	Glu	Arg	Gly	Leu	Tyr	Lys	Ser	Leu	Lys	Gly	225	230	235	240
Ala	Cys	Lys	Leu	Lys	Leu	Cys	Gly	Val	Pro	Gly	Ile	Arg	Leu	Met	Asp	245	250	255	
Gly	Thr	Trp	Val	Ser	Ile	Gln	Thr	Ser	Glu	Asp	Ile	Lys	Trp	Cys	Pro	260	265	270	
Pro	Asp	Arg	Leu	Val	Asn	Leu	His	Asp	Phe	His	Ser	Asp	Glu	Leu	Glu	275	280	285	
His	Leu	Val	Val	Glu	Glu	Leu	Ile	Lys	Arg	Arg	Glu	Asn	Cys	Leu	Asp	290	295	300	
Ala	Leu	Glu	Ser	Ile	Met	Thr	Thr	Lys	Ser	Val	Ser	Phe	Arg	Arg	Leu	305	310	315	320
Ser	His	Leu	Arg	Arg	Leu	Val	Pro	Gly	Phe	Gly	Lys	Ala	Tyr	Thr	Ile	325	330	335	
Phe	Asn	Lys	Thr	Leu	Ile	Glu	Ala	Asp	Ala	His	Tyr	Lys	Ser	Ile	Lys	340	345	350	
Thr	Trp	Asn	Glu	Val	Ile	Pro	Ser	Lys	Gly	Cys	Leu	Glu	Val	Gly	Gly	355	360	365	
Lys	Cys	His	Pro	Pro	Val	Asn	Gly	Val	Phe	Phe	Asn	Gly	Ile	Ile	Leu	370	375	380	
Gly	Pro	Asp	Gly	Asn	Val	Leu	Ile	Pro	Glu	Met	Gln	Ser	Ser	Leu	Leu	385	390	395	400
Gln	Gln	His	Met	Glu	Leu	Leu	Glu	Ser	Ser	Val	Ile	Pro	Leu	Met	His	405	410	415	
Pro	Leu	Ala	Asp	Pro	Ser	Thr	Val	Phe	Lys	Glu	Gly	Asp	Glu	Ala	Glu	420	425	430	

Asp Phe Val Glu Val His Leu Pro Asp Val His Lys Arg Ile Ser Gly  
 435 440 445

Val Asp Leu Gly Leu Pro Ser Trp Gly Lys Tyr Leu Leu Met Ser Ala  
 450 455 460

Gly Ala Leu Ala Ile Leu Ile Leu Ala Ile Val Leu Ile Ile Cys Cys  
 465 470 475 480

Arg Arg Val Asn Lys Thr Gly Ser Thr Gln Arg Gly His Arg Glu Ser  
 485 490 495

Arg Gly Lys Met Ser Val Ala Pro Gln Asn Gly Lys Ile Ile Ser Ser  
 500 505 510

Trp Glu Leu Tyr Lys Arg Glu Ser Glu Thr Gly Leu  
 515 520

<210> 26

<211> 525

<212> PRT

<213> Lyssavirus sp.

<220>

<223> PL

<400> 26

Met Leu Leu Gln Ile Val Leu Leu Met Ser Leu Met Val Phe Ser Pro  
 1 5 10 15

Cys Pro Gly Lys Phe Pro Leu Tyr Thr Ile Pro Asp Lys Leu Gly Pro  
 20 25 30

Trp Ser Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Ile  
 35 40 45

Val Glu Asp Glu Gly Cys Thr Ser Leu Ser Gly Phe Ser Tyr Met Glu  
 50 55 60

Leu Lys Val Gly Phe Ile Thr Thr Ile Lys Val Ser Gly Phe Thr Cys  
 65 70 75 80

Thr Gly Val Val Thr Glu Ser Glu Thr Tyr Thr Asn Phe Phe Gly Tyr  
 85 90 95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Pro Glu Phe  
 100 105 110

Cys Arg Asn Ala Tyr Asn Trp Lys Val Ala Gly Asp Pro Arg Tyr Glu  
 115 120 125

Glu Ser Leu His Asn Pro Tyr Pro Asp Tyr His Trp Leu Arg Thr Val  
 130 135 140

Thr Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Val Asp  
 145 150 155 160

Met Asp Pro Tyr Asp Lys Ser Leu His Ser Lys Met Phe Pro Lys Gly  
 165 170 175  
 Thr Cys Ser Gly Ala Ser Val Pro Ser Ile Phe Cys Ser Thr Asn His  
 180 185 190  
 Asp Tyr Thr Leu Trp Met Pro Glu Asn Pro Lys Pro Gly Met Ser Cys  
 195 200 205  
 Asp Ile Phe Thr Thr Ser Lys Gly Lys Lys Ala Ser Lys Gly Gly Lys  
 210 215 220  
 Val Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Lys Leu Cys Gly Ile Ser Gly Leu Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Ile Gln Asn His Glu Glu Ala Lys Trp Cys Ser  
 260 265 270  
 Pro Asp Gln Leu Val Asn Ile His Asp Phe His Ser Asp Glu Ile Glu  
 275 280 285  
 His Leu Ile Val Glu Glu Leu Val Arg Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Ser Ile Met Thr Thr Lys Ser Val Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile  
 325 330 335  
 Val Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Asn Gln Val Arg  
 340 345 350  
 Thr Trp Asn Glu Ile Ile Pro Ser Lys Gly Cys Leu Lys Val Arg Glu  
 355 360 365  
 Arg Cys His Pro Pro Tyr Asn Gly Val Phe Phe Asn Gly Ile Ile Leu  
 370 375 380  
 Ser Pro Asp Gly His Val Leu Ile Pro Glu Met Gln Ser Ser Leu Leu  
 385 390 395 400  
 Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Ile Pro Leu Ile His  
 405 410 415  
 Pro Leu Ala Asp Pro Ser Thr Val Phe Tyr Arg Asp Asp Glu Ala Glu  
 420 425 430  
 Asp Phe Ile Glu Val His Leu Pro Asp Val Gln Lys Gln Val Ser Gly  
 435 440 445  
 Ile Asp Leu Gly Leu Ser Glu Trp Glu Arg Tyr Leu Ile Ile Gly Ala  
 450 455 460

Ser Ala Val Ile Leu Phe Ala Leu Ala Ile Ile Phe Ala Val Cys Cys  
465 470 475 480

Arg Arg Cys Lys Arg Arg Lys Lys Ala Arg Thr Asp Arg Ile Glu Leu  
485 490 495

Asp Arg Lys Val Ser Val Thr Ser Gln Ser Gly Lys Val Ile Pro Ser  
500 505 510

Trp Glu Ser Tyr Lys Leu Pro Lys Ser His Phe Arg Ser  
515 520 525

<210> 27

<211> 524

<212> PRT

<213> Lyssavirus sp.

<220>

<223> EBL1POL

<400> 27

Met Leu Leu Ser Thr Ala Ile Phe Ala Phe Phe Leu Asn Cys Ala Pro  
1 5 10 15

Cys Leu Ala Lys Phe Pro Ile Tyr Thr Ile Pro Asp Lys Ile Gly Pro  
20 25 30

Trp Ser Pro Ile Asp Ile Asn His Leu Ser Cys Pro Asn Asn Leu Ile  
35 40 45

Val Glu Asp Glu Gly Cys Thr Thr Leu Thr Pro Phe Ser Tyr Met Glu  
50 55 60

Leu Lys Val Gly Tyr Ile Thr Thr Ile Ile Glu Ser Gly Phe Thr Cys  
65 70 75 80

Thr Gly Val Ile Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
85 90 95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Val Ser Ala  
100 105 110

Cys Arg Asp Ala Tyr Asn Trp Lys Ile Thr Gly Asp Pro Arg Tyr Glu  
115 120 125

Glu Ser Leu His Asn Pro Tyr Pro Asp Ser His Trp Leu Arg Thr Val  
130 135 140

Lys Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Val Asp  
145 150 155 160

Met Asp Ala Tyr Asp Lys Asn Leu Tyr Ser Lys Met Phe Pro Asn Gly  
165 170 175

Lys Cys Leu Ala Ser Pro Pro Ser Ala Ile Cys Cys Pro Thr Asn His  
180 185 190

Asp Tyr Thr Ile Trp Ile Pro Glu Asn Pro Lys Pro Gly Leu Ser Cys  
 195 200 205  
 Asp Ile Phe Thr Thr Ser Lys Gly Lys Lys Ala Thr Lys Asp Gly Arg  
 210 215 220  
 Leu Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Arg Leu Cys Gly Val Pro Gly Met Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Leu Gln Lys Thr Glu Ala Pro Glu Trp Cys Ser  
 260 265 270  
 Pro Asp Gln Leu Val Asn Val His Asp Phe His Thr Asp Glu Ile Glu  
 275 280 285  
 His Leu Val Val Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Thr Ile Ile Thr Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Phe Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Leu  
 325 330 335  
 Ile Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Val Arg  
 340 345 350  
 Glu Trp Lys Glu Val Ile Pro Ser Lys Gly Cys Leu Met Ala Gly Gly  
 355 360 365  
 Arg Cys His Pro His Tyr Ser Gly Ile Phe Phe Asn Gly Ile Ile Leu  
 370 375 380  
 Ser Pro Gly Gly Asp Val Leu Ile Pro Glu Met Gln Ser Ala Leu Leu  
 385 390 395 400  
 Gln Gln His Ile Glu Leu Leu Glu Ser Ser Met Ile Pro Leu Arg His  
 405 410 415  
 Pro Leu Ala Asp Pro Ser Thr Val Phe Arg Lys Asp Asp Glu Ala Glu  
 420 425 430  
 Asp Phe Val Glu Val His Leu Pro Asp Thr Gln Lys Leu Ile Ser Gly  
 435 440 445  
 Ile Asp Leu Gly Phe Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Ile  
 450 455 460  
 Ser Val Leu Ala Leu Leu Ala Leu Ala Ile Ile Thr Ala Ala Cys Cys  
 465 470 475 480  
 Lys Arg Phe Lys Arg Arg Arg Arg Pro Lys Pro Asn Pro Ile Glu Leu  
 485 490 495

Ile Arg Lys Val Ser Val Thr Ser Gln Ser Gly Arg Ala Ile Pro Ser  
                   500                                  505                                  510

Trp Glu Ser Tyr Lys Val Gly Pro Pro Gly Glu Ser  
                   515                                  520

<210> 28

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<212> PRT

<213> Lyssavirus sp.

<220>

<223> EBL1FRA

<400> 28

Met Leu Leu Ser Thr Ala Ile Phe Ala Phe Phe Leu Asn Cys Ala Pro  
   1                                  5                                  10                                  15

Cys Leu Gly Lys Phe Pro Ile Tyr Thr Ile Pro Asp Lys Ile Gly Pro  
                   20                                  25                                  30

Trp Ser Pro Ile Asp Ile Asn His Leu Ser Cys Pro Asn Asn Leu Ile  
                   35                                  40                                  45

Val Glu Asp Glu Gly Cys Thr Thr Leu Thr Pro Phe Ser Tyr Met Glu  
                   50                                  55                                  60

Leu Lys Val Gly Tyr Ile Thr Thr Ile Lys Ile Glu Gly Phe Thr Cys  
   65                                  70                                  75                                  80

Thr Gly Val Ile Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
                   85                                  90                                  95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Val Ser Ala  
                   100                                  105                                  110

Cys Arg Asp Ala Tyr Asn Trp Lys Ile Thr Gly Asp Pro Arg Tyr Glu  
                   115                                  120                                  125

Glu Ser Leu His Asn Pro Tyr Pro Asp Ser His Trp Leu Arg Thr Val  
   130                                  135                                  140

Lys Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Val Asp  
   145                                  150                                  155                                  160

Met Asp Ala Tyr Asp Lys Asn Leu Tyr Ser Lys Met Phe Pro Asn Gly  
                   165                                  170                                  175

Lys Cys Leu Ala Ser Pro Pro Ser Ala Thr Cys Cys Pro Thr Asn His  
                   180                                  185                                  190

Asp Tyr Thr Ile Trp Ile Pro Glu Asn Pro Lys Pro Gly Leu Ser Cys  
                   195                                  200                                  205

Asp Ile Phe Thr Thr Ser Lys Gly Lys Lys Ala Thr Lys Asp Gly Lys  
   210                                  215                                  220

Leu Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Arg Leu Cys Gly Val Pro Gly Met Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Leu Gln Lys Thr Glu Ala Pro Glu Trp Cys Ser  
 260 265 270  
 Pro Asp Arg Leu Val Asn Ile His Asp Phe His Thr Asp Glu Ile Glu  
 275 280 285  
 His Leu Val Val Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Thr Ile Ile Thr Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Phe Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Leu  
 325 330 335  
 Ile Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Val Arg  
 340 345 350  
 Glu Trp Thr Glu Val Ile Pro Ser Lys Gly Cys Leu Met Ala Gly Gly  
 355 360 365  
 Arg Cys His Pro His Tyr Ser Gly Ile Phe Phe Asn Gly Ile Ile Leu  
 370 375 380  
 Ser Pro Gly Gly Asp Val Leu Ile Pro Glu Met Gln Ser Ala Leu Leu  
 385 390 395 400  
 Gln Gln His Ile Glu Leu Leu Glu Ser Ser Met Ile Pro Leu Arg His  
 405 410 415  
 Pro Leu Ala Asp Pro Ser Thr Val Phe Lys Arg Asp Asp Glu Ala Glu  
 420 425 430  
 Asp Phe Val Glu Val His Leu Pro Asp Thr Gln Lys Leu Ile Ser Gly  
 435 440 445  
 Ile Asp Leu Gly Phe Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Ile  
 450 455 460  
 Ser Val Leu Ala Leu Leu Ala Leu Ala Ile Ile Thr Ala Ala Cys Cys  
 465 470 475 480  
 Lys Arg Phe Lys Arg Arg Arg Arg Pro Lys Pro Asn Pro Ile Glu Leu  
 485 490 495  
 Ile Arg Lys Val Ser Val Thr Ser Gln Ser Gly Arg Ala Ile Pro Ser  
 500 505 510  
 Trp Glu Ser Tyr Lys Val Gly Thr Thr Ser Glu Ser  
 515 520



<210> 29  
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 <212> PRT  
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<220>  
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<400> 29

Met	Pro	Phe	Gln	Thr	Val	Leu	Ser	Ala	Leu	Leu	Ser	Ala	Leu	Thr	Leu
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Cys	Ala	Gly	Lys	Phe	Pro	Ile	Tyr	Thr	Ile	Pro	Asp	Lys	Leu	Gly	Pro
		20						25					30		
Trp	Ser	Pro	Ile	Asp	Ile	His	His	Leu	Ser	Cys	Pro	Thr	Asn	Met	Val
		35					40						45		
Val	Glu	Asp	Glu	Gly	Cys	Thr	Thr	Leu	Thr	Val	Phe	Ser	Tyr	Met	Glu
	50					55					60				
Leu	Arg	Val	Gly	Tyr	Ile	Thr	Thr	Ile	Lys	Val	Asp	Gly	Phe	Thr	Cys
65					70					75					80
Thr	Gly	Val	Val	Thr	Glu	Ala	Glu	Thr	Tyr	Thr	Asn	Phe	Val	Gly	Tyr
				85					90					95	
Val	Thr	Thr	Thr	Phe	Lys	Arg	Lys	His	Phe	Arg	Pro	Ser	Pro	Ser	Ala
			100					105					110		
Cys	Arg	Asp	Ala	Tyr	Ser	Trp	Lys	Asn	Ala	Gly	Asp	Pro	Arg	Tyr	Glu
		115					120					125			
Glu	Ser	Leu	His	Asn	Pro	Tyr	Pro	Asp	Ser	His	Trp	Leu	Arg	Thr	Val
	130					135					140				
Thr	Thr	Thr	Lys	Glu	Ser	Leu	Leu	Ile	Ile	Ser	Pro	Ser	Val	Val	Asn
145					150					155					160
Met	Asp	Ala	Tyr	Asp	Lys	Thr	Leu	Tyr	Ser	Lys	Ile	Phe	Leu	Asn	Gly
				165					170					175	
Lys	Cys	Ser	Gly	Val	Ser	Gln	Val	Ser	Pro	Phe	Cys	Ser	Thr	Asn	His
			180					185					190		
Asp	Tyr	Thr	Ile	Trp	Met	Pro	Glu	Asn	Pro	Asn	Pro	Gly	Val	Ser	Cys
		195					200					205			
Asp	Ile	Phe	Thr	Thr	Ser	Lys	Gly	Lys	Lys	Ala	Thr	Lys	Asp	Gly	Lys
	210					215					220				
Leu	Cys	Gly	Phe	Val	Asp	Glu	Arg	Gly	Leu	Tyr	Lys	Ser	Leu	Lys	Gly
225					230					235					240
Ala	Cys	Lys	Leu	Lys	Leu	Cys	Gly	Ile	Ser	Gly	Met	Arg	Leu	Met	Asp
				245					250					255	

Gly Ser Trp Val Ser Ile Gln Asn His Asp Glu Ala Lys Trp Cys Ser  
 260 265 270

Pro Asp Gln Leu Val Asn Ile His Asp Phe His Ser Asp Glu Val Glu  
 275 280 285

His Leu Ile Ala Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300

Ala Leu Glu Ser Ile Met Thr Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320

Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile  
 325 330 335

Ile Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Ile Arg  
 340 345 350

Glu Trp Thr Asp Val Ile Pro Ser Lys Gly Cys Leu Met Ala Gly Gly  
 355 360 365

Arg Cys Tyr Pro His His Asn Gly Val Phe Phe Asn Gly Ile Ile Leu  
 370 375 380

Ser Pro Asp Gly His Val Leu Ile Pro Glu Met Gln Ser Ala Met Leu  
 385 390 395 400

Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Ile Pro Leu Met His  
 405 410 415

Pro Leu Ala Asp Pro Ser Thr Ile Phe Lys Lys Asp Asp Gly Ala Glu  
 420 425 430

Asp Phe Val Glu Val His Leu Pro Asp Val Gln Lys Gln Ile Ser Gly  
 435 440 445

Ile Asp Leu Gly Leu Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Val  
 450 455 460

Ser Ala Leu Ala Leu Leu Ala Leu Met Ile Phe Ile Ala Ala Cys Cys  
 465 470 475 480

Lys Arg Val Lys His Lys Lys Arg Ala Lys Pro Asn Pro Val Glu Leu  
 485 490 495

Ile Arg Lys Val Ser Val Thr Ser Gln Ser Gly Arg Pro Ile Pro Ser  
 500 505 510

Trp Glu Ser Tyr Lys Val Glu Thr Gly Gly Gln Ser  
 515 520

<210> 30

<211> 524

<212> PRT

<213> Lyssavirus sp.

&lt;220&gt;

&lt;223&gt; EBL2HOL

&lt;400&gt; 30

Met	Pro	Phe	Gln	Ala	Val	Leu	Ser	Ala	Leu	Leu	Ser	Ala	Leu	Thr	Leu	1	5	10	15
Cys	Val	Gly	Lys	Phe	Pro	Ile	Tyr	Thr	Ile	Pro	Asp	Lys	Leu	Gly	Pro	20	25	30	
Trp	Ser	Pro	Ile	Asp	Ile	His	His	Leu	Ser	Cys	Pro	Thr	Asn	Met	Val	35	40	45	
Val	Glu	Asp	Glu	Gly	Cys	Thr	Thr	Leu	Thr	Val	Phe	Ser	Tyr	Met	Glu	50	55	60	
Leu	Lys	Val	Gly	Tyr	Ile	Thr	Thr	Ile	Lys	Val	Asn	Glu	Phe	Thr	Cys	65	70	75	80
Thr	Gly	Val	Val	Thr	Glu	Ala	Glu	Thr	Tyr	Thr	Asn	Phe	Val	Gly	Tyr	85	90	95	
Val	Thr	Thr	Thr	Phe	Lys	Arg	Lys	Asp	Phe	Arg	Pro	Ser	Pro	Ser	Ala	100	105	110	
Cys	Arg	Asp	Ala	Tyr	Ser	Cys	Lys	Thr	Ala	Gly	Asp	Pro	Arg	Tyr	Glu	115	120	125	
Glu	Ser	Leu	His	Asn	Pro	Tyr	Pro	Asp	Ser	His	Trp	Leu	Thr	Cys	Thr	130	135	140	
Thr	Thr	Thr	Lys	Glu	Ser	Val	Leu	Ile	Ile	Ser	Pro	Ser	Val	Ala	Asp	145	150	155	160
Met	Asp	Ala	Tyr	Asp	Lys	Thr	Leu	Tyr	Ser	Lys	Ile	Phe	Leu	Asn	Gly	165	170	175	
Lys	Cys	Ser	Gly	Val	Ser	Gln	Val	Ser	Pro	Phe	Cys	Ser	Thr	Asn	His	180	185	190	
Asp	Tyr	Thr	Ile	Trp	Met	Pro	Glu	Asn	Pro	Asn	Pro	Gly	Val	Ser	Cys	195	200	205	
Asp	Ile	Phe	Thr	Thr	Ser	Lys	Gly	Lys	Lys	Ala	Thr	Lys	Asp	Gly	Lys	210	215	220	
Leu	Cys	Gly	Phe	Val	Asp	Glu	Arg	Gly	Leu	Tyr	Lys	Ser	Leu	Lys	Gly	225	230	235	240
Ala	Cys	Lys	Leu	Lys	Leu	Cys	Gly	Ile	Ser	Gly	Met	Arg	Leu	Met	Asp	245	250	255	
Gly	Ser	Trp	Val	Ser	Ile	Gln	Asn	His	Asp	Glu	Ala	Lys	Trp	Cys	Ser	260	265	270	
Pro	Asp	Gln	Leu	Val	Asn	Ile	His	Asp	Phe	His	Ser	Asp	Glu	Val	Glu	275	280	285	

His Leu Ile Ala Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300

Ala Leu Glu Ser Ile Met Thr Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320

Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Val  
 325 330 335

Ile Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Ile Arg  
 340 345 350

Glu Trp Thr Asp Val Ile Pro Ser Lys Gly Cys Leu Met Ala Gly Gly  
 355 360 365

Arg Cys Tyr Pro His His Asn Gly Val Phe Phe Asn Gly Ile Ile Leu  
 370 375 380

Ser Pro Asp Gly His Val Leu Ile Pro Glu Met Gln Ser Ala Met Leu  
 385 390 395 400

Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Ile Pro Leu Met His  
 405 410 415

Pro Leu Ala Asp Pro Ser Thr Ile Phe Lys Lys Asp Asp Gly Ala Glu  
 420 425 430

Asp Phe Val Glu Val His Leu Pro Asp Val Gln Lys Gln Ile Ser Gly  
 435 440 445

Ile Asp Leu Gly Leu Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Val  
 450 455 460

Ser Ala Leu Ala Phe Leu Ala Leu Met Ile Phe Ile Ala Ala Cys Cys  
 465 470 475 480

Arg Arg Val Lys Arg Lys Lys Arg Ala Lys Pro Asn Pro Val Glu Leu  
 485 490 495

Ile Arg Lys Val Ser Val Thr Ser Gln Ser Gly Arg Pro Ile Pro Ser  
 500 505 510

Trp Glu Ser Tyr Lys Val Glu Thr Gly Gly Gln Ser  
 515 520

<210> 31

<211> 533

<212> PRT

<213> Lyssavirus sp.

<220>

<223> Duv1SAF

<400> 31

Met Pro Leu Asn Ala Val Ile Phe Thr Leu Leu Leu Arg Cys Ser Ile  
 1 5 10 15

Cys Leu Gly Lys Phe Pro Phe Tyr Thr Ile Pro Asp Lys Leu Gly Pro  
 20 25 30  
 Trp Ser Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Val  
 35 40 45  
 Val Glu Asp Glu Gly Cys Thr Thr Leu Thr Pro Phe Ser Tyr Met Glu  
 50 55 60  
 Leu Lys Val Gly Tyr Ile Thr Ser Ile Lys Val Ser Gly Phe Thr Cys  
 65 70 75 80  
 Thr Gly Val Val Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Arg Arg Arg His Phe Arg Pro Ser Val Asn Ser  
 100 105 110  
 Cys Arg Asp Ala Tyr Asn Trp Lys Ile Ala Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Asn Pro Tyr Pro Asp Ser His Trp Leu Arg Thr Val  
 130 135 140  
 Lys Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Ala Asp  
 145 150 155 160  
 Met Asp Ala Tyr Asp Lys Lys Leu Tyr Ser Lys Met Phe Pro Asn Gly  
 165 170 175  
 Arg Cys Ser Glu Ile Ser Pro Gly Ser Pro Phe Cys Pro Thr Asn His  
 180 185 190  
 Glu Tyr Thr Ile Trp Met Pro Glu Ser Ser Asn Pro Gly Ile Ser Cys  
 195 200 205  
 Asp Ile Phe Thr Arg Ser Met Gly Lys Lys Ala Thr Lys Asp Gly Gln  
 210 215 220  
 Leu Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Arg Leu Arg Leu Cys Gly Ile Ser Gly Leu Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Leu Pro Gln Val Asn Asn Ser Glu Trp Cys Ser  
 260 265 270  
 Pro Asp Gln Leu Val Asn Ile His Asp Phe His Ser Asp Glu Ile Glu  
 275 280 285  
 His Leu Val Ala Asp Glu Leu Val Lys Lys Arg Glu Asp Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Thr Ile Ile Phe Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320

Ser Arg Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile  
325 330 335

Ile Asn Arg Thr Leu Met Glu Ala Glu Ala His Tyr Lys Ser Val Arg  
340 345 350

Glu Trp Lys Glu Ile Ile Pro Ser Lys Gly Cys Leu Lys Ala Gly Gly  
355 360 365

Arg Cys Tyr Pro His His Asn Ile Val Phe Phe Asn Gly Ile Ile Leu  
370 375 380

Gly Pro Gly Gly Lys Ile Leu Ile Pro Glu Met Gln Ser Ala Leu Leu  
385 390 395 400

Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Val Pro Leu Lys His  
405 410 415

Pro Leu Ala Asp Pro Ser Thr Val Phe Lys Asn Asp Asp Glu Ala Glu  
420 425 430

Ser Phe Val Asp Val His Leu Pro Asp Thr Asn Gln Lys Ile Ser Gly  
435 440 445

Ile Asp Leu Gly Leu Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Val  
450 455 460

Ser Ala Val Ala Leu Leu Ala Leu Ser Ile Ile Met Arg Val Cys Cys  
465 470 475 480

Lys Arg Phe Lys Asn Arg Arg Lys Ser Lys Pro Ser Pro Val Glu Leu  
485 490 495

Thr Arg Lys Val Ser Val Ile Ser Lys Gly Asn Gly Pro Val Pro Ser  
500 505 510

Trp Glu Ser Tyr Lys Glu Gly Thr Thr Gly Asp Val Arg Asn Thr Thr  
515 520 525

Pro Ser Thr Arg Glu  
530

<210> 32

<211> 533

<212> PRT

<213> Lyssavirus sp.

**<220>**

<223> Duv2SAF

<400> 32

Met Pro Leu Asn Ala Val Ile Phe Thr Leu Leu Leu Arg Cys Ser Ile  
1 5 10 15

Cys Leu Gly Lys Phe Pro Phe Tyr Thr Ile Pro Asp Lys Leu Gly Pro  
20 25 30

Trp Ser Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Val  
 35 40 45  
 Val Glu Asp Glu Gly Cys Thr Thr Leu Thr Pro Phe Ser Tyr Met Glu  
 50 55 60  
 Leu Lys Val Gly Tyr Ile Thr Ser Ile Lys Val Ser Gly Phe Thr Cys  
 65 70 75 80  
 Thr Gly Val Val Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Arg Arg Arg His Phe Arg Pro Ser Val Asn Ser  
 100 105 110  
 Cys Arg Asp Ala Tyr Asn Trp Lys Ile Ala Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Asn Pro Tyr Pro Asp Ser His Trp Leu Arg Thr Val  
 130 135 140  
 Lys Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Ala Asp  
 145 150 155 160  
 Met Asp Ala Tyr Asp Lys Lys Leu Tyr Ser Lys Met Phe Pro Asn Gly  
 165 170 175  
 Arg Cys Ser Glu Ile Ser Pro Gly Ser Pro Phe Cys Pro Thr Asn His  
 180 185 190  
 Glu Tyr Thr Ile Trp Met Pro Glu Ser Ser Asn Pro Gly Ile Ser Cys  
 195 200 205  
 Asp Ile Phe Thr Arg Ser Met Gly Lys Lys Ala Thr Lys Asp Gly Gln  
 210 215 220  
 Leu Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Arg Leu Arg Leu Cys Gly Ile Ser Gly Leu Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Leu Pro Gln Val Asn Asn Ser Glu Trp Cys Ser  
 260 265 270  
 Pro Asp Gln Leu Val Asn Ile His Asp Phe His Ser Asp Glu Ile Glu  
 275 280 285  
 His Leu Val Ala Asp Glu Leu Val Lys Lys Arg Glu Asp Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Thr Ile Leu Phe Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile  
 325 330 335

Ile Asn Arg Thr Leu Met Glu Ala Glu Ala His Tyr Lys Ser Val Arg  
340 345 350

Glu Trp Lys Glu Ile Ile Pro Ser Lys Gly Cys Leu Lys Ala Gly Gly  
355 360 365

Arg Cys Tyr Pro His His Asn Gly Ile Phe Phe Asn Gly Ile Ile Leu  
370 375 380

Gly Pro Gly Gly Glu Ile Leu Ile Pro Glu Met Gln Ser Ala Leu Leu  
385 390 395 400

Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Val Pro Leu Lys His  
405 410 415

Pro Leu Ala Asp Pro Ser Thr Val Phe Lys Asn Asp Asp Glu Ala Glu  
420 425 430

Ser Phe Val Asp Val His Leu Pro Asp Thr Asn Gln Lys Ile Ser Gly  
435 440 445

Ile Asp Leu Gly Leu Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Val  
450 455 460

Ser Ala Val Ala Leu Leu Ala Leu Ser Ile Ile Ile Ala Val Cys Cys  
465 470 475 480

Lys Arg Phe Arg Lys Arg Lys Lys Ser Lys Pro Gly Pro Val Glu Leu  
485 490 495

Thr Arg Lys Val Ser Val Ile Ser Lys Gly Asn Gly Pro Val Pro Ser  
500 505 510

Trp Glu Ser Tyr Lys Glu Gly Thr Thr Gly Asp Val Arg Asn Thr Thr  
515 520 525

Pro Ser Thr Arg Glu  
530

<210> 33

<211> 522

<212> PRT

<213> Lyssavirus sp.

<220>

<223> Lag1NGA

<400> 33

Met Ser Gln Leu Asn Leu Ile Leu Phe Phe Cys Val Ile Ile Val Leu  
1 5 10 15

Ser Val Glu Asp Phe Pro Leu Tyr Thr Ile Pro Glu Lys Ile Gly Pro  
20 25 30

Trp Thr Pro Ile Asp Leu Ile His Leu Ser Cys Pro Asn Asn Leu Gln  
35 40 45



Ser Glu Asp Glu Gly Cys Gly Thr Ser Ser Ser Val Ser Tyr Val Glu  
 50 55 60  
 Leu Lys Thr Gly Tyr Leu Thr His Gln Lys Val Ser Gly Phe Thr Cys  
 65 70 75 80  
 Thr Gly Val Val Asn Glu Ala Val Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Lys Arg Lys His Phe Lys Pro Thr Ala Leu Ala  
 100 105 110  
 Cys Arg Asp Ala Tyr His Trp Lys Ile Ser Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Thr Pro Tyr Pro Asp Asn Ser Trp Leu Arg Thr Val  
 130 135 140  
 Thr Thr Thr Lys Glu Ser Leu Val Ile Ile Ser Pro Ser Ile Val Glu  
 145 150 155 160  
 Met Asp Val Tyr Ser Arg Thr Leu His Ser Pro Met Phe Pro Thr Gly  
 165 170 175  
 Thr Cys Ser Arg Phe Tyr Pro Ser Ser Pro Ser Cys Ala Thr Asn His  
 180 185 190  
 Asp Tyr Thr Leu Trp Leu Pro Asp Asp Pro Asn Leu Ser Leu Ala Cys  
 195 200 205  
 Asp Ile Phe Val Thr Ser Thr Gly Lys Lys Ser Met Asn Gly Ser Arg  
 210 215 220  
 Met Cys Gly Phe Thr Asp Glu Arg Gly Tyr Tyr Arg Thr Ile Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Thr Leu Cys Gly Lys Pro Gly Leu Arg Leu Phe Asp  
 245 250 255  
 Gly Thr Trp Ile Ser Phe Thr Arg Pro Glu Val Thr Thr Trp Cys Leu  
 260 265 270  
 Pro Asn Gln Leu Val Asn Ile His Asn Asn Arg Ile Asp Glu Val Glu  
 275 280 285  
 His Leu Ile Val Glu Asp Leu Ile Arg Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Thr Leu Glu Thr Val Leu Met Ser Lys Ser Ile Ser Phe Arg Arg Val  
 305 310 315 320  
 Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala Tyr Thr Ile  
 325 330 335  
 Leu Asn Gly Ser Leu Ile Gln Thr Asn Val His Tyr Leu Lys Val Asp  
 340 345 350

Asn Trp Ser Glu Ile Leu Pro Ser Lys Gly Cys Leu Lys Ile Asn Asn  
355 360 365

Gln Cys Val Ala His Asp Glu Gly Val Phe Phe Asn Gly Ile Ile Lys  
370 375 380

Gly Pro Asp Gly His Ile Leu Ile Pro Glu Met Gln Ser Ser Leu Trp  
385 390 395 400

Lys Gln His Met Asp Leu Phe Lys Ala Ala Val Phe Pro Leu Arg His  
405 410 415

Pro Leu Ile Glu Pro Gly Ser Leu Phe Asn Lys Asp Gly Asp Ala Asp  
420 425 430

Glu Phe Val Asp Val His Met Pro Asp Val His Lys Leu Val Ser Asp  
435 440 445

Val Asp Leu Gly Leu Pro Asp Trp Ser Leu Tyr Ala Leu Ile Gly Ala  
450 455 460

Thr Ile Ile Ala Phe Phe Ile Leu Ile Cys Leu Ile Arg Ile Cys Cys  
465 470 475 480

Lys Lys Arg Gly Arg Arg Asn Ser Pro Thr Asn Arg Pro Asp Leu Pro  
485 490 495

Ile Gly Leu Ser Thr Thr Pro Gln Pro Lys Ser Lys Val Ile Ser Ser  
500 505 510

Trp Glu Ser Tyr Lys Gly Thr Ser Asn Val  
515 520

<210> 34

<211> 522

<212> PRT

<213> Lyssavirus sp.

**<220>**

<223> Lag2CAR

<400> 34

Met Ser Gln Leu Ile Leu Ile Pro Phe Leu Cys Val Val Ile Val Ile  
1 5 10 15

Ser Val Gly Asp Phe Pro Leu Tyr Thr Ile Pro Glu Lys Ile Gly Thr  
20 25 30

Trp Thr Pro Ile Asp Leu Ile His Leu Ser Cys Pro Asn Asn Leu Leu  
35 40 45

Ser Glu Asp Asp Gly Cys Ser Asn Thr Ala Thr Phe Asn Tyr Ile Glu  
50 55 60

Leu Lys Thr Gly Tyr Leu Thr His Gln Lys Val Ser Gly Phe Thr Cys  
65 70 75 80

Thr Gly Val Val Asn Glu Ala Val Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Lys Arg Lys His Phe Lys Pro Thr Ala Leu Ala  
 100 105 110  
 Cys Arg Asp Ala Phe His Trp Lys Ile Ser Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Thr Pro Tyr Pro Asp Asn Ser Trp Leu Arg Thr Val  
 130 135 140  
 Thr Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Ile Val Glu  
 145 150 155 160  
 Met Asp Val Tyr Ser Arg Thr Leu His Ser Pro Met Phe Pro Gly Gly  
 165 170 175  
 Val Cys Ser Lys Phe Tyr Pro Ser Ser Pro Ser Cys Pro Thr Asn His  
 180 185 190  
 Asp Tyr Thr Leu Trp Leu Pro Glu Asp Ala Asn Leu Ser Met Ala Cys  
 195 200 205  
 Asp Ile Phe Ile Thr Ser Thr Gly Lys Lys Ser Met Asn Gly Ser Arg  
 210 215 220  
 Met Cys Gly Phe Thr Asp Glu Arg Gly Phe Tyr Arg Thr Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Thr Leu Cys Gly Lys Pro Gly Leu Arg Leu Tyr Asp  
 245 250 255  
 Gly Thr Trp Val Ser Phe Thr Arg Pro Glu Ile Asn Val Trp Cys Ser  
 260 265 270  
 Pro Asn Gln Leu Val Asn Val His Asn Asn Arg Leu Asp Glu Ile Glu  
 275 280 285  
 His Leu Ile Val Gly Asp Leu Ile Arg Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Thr Leu Glu Thr Ile Leu Met Ser Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala Tyr Thr Ile  
 325 330 335  
 Ile Asn Gly Ser Leu Met Glu Thr Asn Val His Tyr Leu Arg Val Asp  
 340 345 350  
 Ser Trp Asn Asp Ile Leu Pro Ser Lys Gly Cys Leu Lys Met Asn Lys  
 355 360 365  
 Gln Cys Val Asp Ser Tyr Arg Gly Val Phe Phe Asn Gly Ile Ile Lys  
 370 375 380

Gly His Asp Gly His Ile Leu Ile Pro Glu Met Gln Ser Ser Leu Leu  
 385 390 395 400  
 Lys Gln His Met Asp Leu Leu Lys Ala Ala Val Phe Pro Leu Arg His  
 405 410 415  
 Pro Leu Ile Asp Gln Asn Ser Leu Phe Lys Lys Asp Gly Asp Ala Asp  
 420 425 430  
 Asp Phe Val Glu Val His Met Pro Asp Ile Gln Lys Leu Ile Ser Asp  
 435 440 445  
 Val Asp Leu Gly Leu Pro Ser Trp Gly Leu Tyr Val Met Ile Gly Ala  
 450 455 460  
 Ala Val Ile Ala Phe Leu Val Leu Ile Cys Leu Ile Arg Ile Cys Cys  
 465 470 475 480  
 Lys Lys Lys Thr Arg Thr Arg Thr Ser Met Glu Arg Pro Asp Pro Pro  
 485 490 495  
 Ile Ser Leu Ser Thr Thr Pro Gln Ser Arg Ala Lys Val Val Ser Ser  
 500 505 510  
 Trp Glu Ser Tyr Lys Gly Ser Ser Asn Val  
 515 520

<210> 35  
 <211> 523  
 <212> PRT  
 <213> Lyssavirus sp.

<220>  
 <223> Mok3ETP

<400> 35  
 Met Asn Ile Pro Cys Phe Ala Val Ile Leu Ser Leu Ala Thr Thr His  
 1 5 10 15  
 Cys Leu Glu Lys Phe Leu Ile Tyr Thr Ile Pro Glu Lys Ile Glu Lys  
 20 25 30  
 Trp Thr Pro Ile Asp Met Ile His Leu Ser Cys Pro Asn Asn Met Leu  
 35 40 45  
 Ser Glu Glu Glu Gly Cys Asn Thr Glu Ser Pro Phe Thr Tyr Phe Glu  
 50 55 60  
 Leu Lys Ser Gly Tyr Leu Ala His Gln Lys Val Pro Gly Phe Thr Cys  
 65 70 75 80  
 Thr Gly Val Val Asn Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Lys Arg Lys His Phe Lys Pro Thr Val Ala Ala  
 100 105 110

Cys Arg Asp Ala Tyr Asn Trp Lys Val Ser Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Thr Pro Tyr Pro Asp Ser Ser Trp Leu Arg Thr Val  
 130 135 140  
 Thr Thr Thr Lys Glu Ala Leu Leu Ile Ile Ser Pro Ile Val Glu Asp  
 145 150 155 160  
 Met Ile Ala Gly Arg Lys Thr Leu His Ser Pro Met Phe Pro Ser Gly  
 165 170 175  
 Lys Cys Ser Lys Leu Tyr Pro Ser Val Pro Ser Cys Thr Thr Asn His  
 180 185 190  
 Asp Tyr Thr Leu Trp Leu Pro Glu Asp Ser Ser Leu Ser Leu Ile Cys  
 195 200 205  
 Asp Ile Phe Thr Ser Ser Ser Gly Gln Lys Ala Met Asn Gly Ser Arg  
 210 215 220  
 Ile Cys Gly Phe Lys Asp Glu Arg Gly Phe Tyr Arg Ser Leu Lys Gly  
 225 230 235 240  
 Ser Cys Lys Leu Thr Leu Cys Gly Lys Pro Gly Ile Arg Leu Phe Asp  
 245 250 255  
 Gly Thr Trp Val Ser Phe Thr Lys Pro Asp Val His Val Trp Cys Thr  
 260 265 270  
 Pro Asn Gln Leu Val Asn Ile His Asn Asp Arg Leu Asp Glu Val Glu  
 275 280 285  
 His Leu Ile Val Asp Asp Ile Ile Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Thr Leu Glu Thr Ile Leu Met Ser Gln Ser Val Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala Tyr Thr Ile  
 325 330 335  
 Leu Asn Gly Ser Leu Met Glu Thr Asn Val Tyr Tyr Lys Arg Val Asp  
 340 345 350  
 Arg Trp Ala Asp Ile Leu Pro Ser Arg Gly Cys Leu Lys Val Gly Gln  
 355 360 365  
 Gln Cys Met Asp Pro Val Lys Asn Leu Val Phe Phe Asn Gly Ile Ile  
 370 375 380  
 Lys Gly Pro Asp Gly Gln Ile Leu Ile Pro Glu Met Gln Ser Glu Gln  
 385 390 395 400  
 Leu Lys Gln His Met Asp Leu Leu Lys Ala Ala Met Phe Pro Leu Arg  
 405 410 415

His Pro Leu Ile Asn Arg Glu Ala Val Phe Lys Lys Asp Gly Asn Ala  
                   420                  425                  430

Asp Asp Phe Val Asp Leu His Met Pro Asp Val Gln Lys Ser Val Ser  
           435                  440                  445

Asp Val Asp Leu Gly Leu Pro His Trp Gly Phe Trp Leu Leu Val Gly  
       450                  455                  460

Ala Thr Val Val Ala Phe Val Val Leu Ala Cys Leu Leu Arg Val Cys  
   465                  470                  475                  480

Cys Arg Arg Met Arg Arg Arg Arg Ser Leu Arg Ala Thr Gln Asp Ile  
                   485                  490                  495

Pro Leu Ser Val Ala Pro Ala Pro Val Pro Arg Ala Lys Val Val Ser  
                   500                  505                  510

Ser Trp Glu Ser Ser Lys Gly Leu Pro Gly Thr  
       515                  520

<210> 36

<211> 523

<212> PRT

<213> Lyssavirus sp.

<220>

<223> Mok2ZIM

<400> 36

Met Asn Ile Pro Cys Phe Val Val Ile Leu Ser Leu Ala Thr Thr His  
   1                  5                  10                  15

Ser Leu Gly Glu Phe Pro Leu Tyr Thr Ile Pro Glu Lys Ile Glu Lys  
           20                  25                  30

Trp Thr Pro Ile Asp Met Ile His Leu Ser Cys Pro Asn Asn Leu Leu  
           35                  40                  45

Ser Glu Glu Glu Gly Cys Asn Ala Glu Ser Ser Phe Thr Tyr Phe Glu  
       50                  55                  60

Leu Lys Ser Gly Tyr Leu Ala His Gln Lys Val Pro Gly Phe Thr Cys  
   65                  70                  75                  80

Thr Gly Val Val Asn Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
                   85                  90                  95

Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Val Ala Ala  
           100                  105                  110

Cys Arg Asp Ala Tyr Asn Trp Lys Val Ser Gly Asp Pro Arg Tyr Glu  
       115                  120                  125

Glu Ser Leu His Thr Pro Tyr Pro Asp Ser Ser Trp Leu Arg Thr Val  
       130                  135                  140

Thr Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Ile Val Glu  
 145 150 155 160  
 Met Asp Ile Tyr Gly Arg Thr Leu His Ser Pro Met Phe Pro Ser Gly  
 165 170 175  
 Val Cys Ser Asn Val Tyr Pro Ser Val Pro Ser Cys Glu Thr Asn His  
 180 185 190  
 Asp Tyr Thr Leu Trp Leu Pro Glu Asp Pro Ser Leu Ser Leu Val Cys  
 195 200 205  
 Asp Ile Phe Thr Ser Ser Asn Gly Lys Lys Ala Met Asn Gly Ser Arg  
 210 215 220  
 Ile Cys Gly Phe Lys Asp Glu Arg Gly Phe Tyr Arg Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Thr Leu Cys Gly Arg Pro Gly Ile Arg Leu Phe Asp  
 245 250 255  
 Gly Thr Trp Val Ser Phe Thr Lys Pro Asp Val His Val Lys Thr Cys  
 260 265 270  
 Asn Pro Asp Ile Leu Val Asn Ile His Asn Asp Arg Leu Asp Glu Ile  
 275 280 285  
 Glu His Leu Ile Val Glu Asp Ile Ile Lys Lys Arg Glu Glu Cys Leu  
 290 295 300  
 Asp Thr Leu Glu Thr Ile Leu Met Ser Gln Ser Val Ser Phe Arg Arg  
 305 310 315 320  
 Leu Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala Tyr Thr  
 325 330 335  
 Ile Leu Asn Gly Ser Leu Met Glu Thr Asn Val Tyr Tyr Lys Arg Val  
 340 345 350  
 Asp Lys Trp Ala Asp Ile Leu Pro Ser Lys Gly Cys Leu Lys Val Gly  
 355 360 365  
 Gln Gln Cys Met Glu Pro Val Lys Gly Val Leu Phe Asn Gly Ile Ile  
 370 375 380  
 Lys Gly Pro Asp Gly Gln Ile Leu Ile Pro Glu Met Gln Ser Glu Gln  
 385 390 395 400  
 Leu Lys Gln His Met Asp Leu Leu Lys Ala Ala Val Phe Pro Leu Arg  
 405 410 415  
 His Pro Leu Ile Ser Arg Glu Ala Val Phe Lys Lys Asp Gly Asp Ala  
 420 425 430  
 Asp Asp Phe Val Asp Leu His Met Pro Asp Val His Lys Ser Val Ser  
 435 440 445

Asp Val Asp Leu Gly Leu Pro His Trp Gly Phe Trp Met Leu Ile Gly  
 450 455 460

Ala Thr Ile Val Ala Phe Val Val Leu Val Cys Leu Leu Arg Val Cys  
 465 470 475 480

Cys Lys Arg Val Arg Arg Arg Arg Ser Gly Arg Ala Thr Gln Glu Ile  
 485 490 495

Pro Leu Ser Phe Pro Ser Ala Pro Val Pro Arg Ala Lys Val Val Ser  
 500 505 510

Ser Trp Glu Ser Tyr Lys Gly Leu Pro Gly Thr  
 515 520

<210> 37

<211> 129

<212> PRT

<213> Lyssavirus sp.

<220>

<223> Lag3SAF

<400> 37

Cys Leu Asp Thr Leu Glu Thr Ile Leu Met Ser Lys Ser Ile Ser Phe  
 1 5 10 15

Arg Arg Leu Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala  
 20 25 30

Tyr Thr Ile Ile Asn Gly Ser Leu Met Glu Thr Asn Val His Tyr Leu  
 35 40 45

Arg Val Asp Ser Trp Asn Asp Ile Leu Pro Ser Lys Gly Cys Leu Lys  
 50 55 60

Met Asn Lys Gln Cys Val Asp Ser Tyr Arg Gly Val Phe Phe Asn Gly  
 65 70 75 80

Ile Ile Lys Gly Leu Asp Gly His Ile Leu Ile Pro Glu Met Gln Ser  
 85 90 95

Ser Leu Leu Lys Gln His Met Asp Leu Leu Lys Ala Ala Val Phe Pro  
 100 105 110

Leu Arg His Pro Leu Ile Asp Gln Asn Ser Leu Phe Lys Lys Asp Gly  
 115 120 125

Asp

<210> 38

<211> 129

<212> PRT

<213> Lyssavirus sp.



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&lt;223&gt; Lag4SAF

&lt;400&gt; 38

Cys Leu Asp Thr Leu Glu Thr Ile Leu Met Ser Lys Ser Ile Ser Phe  
 1 5 10 15

Arg Arg Leu Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala  
 20 25 30

Tyr Thr Ile Ile Asn Gly Ser Leu Met Glu Thr Asn Val His Tyr Leu  
 35 40 45

Arg Val Asp Ser Trp Asn Asp Ile Leu Pro Ser Lys Gly Cys Leu Lys  
 50 55 60

Met Asn Lys Gln Cys Val Asp Ser Tyr Arg Gly Val Phe Phe Asn Gly  
 65 70 75 80

Ile Ile Lys Gly Leu Asp Gly His Ile Leu Ile Pro Glu Met Gln Ser  
 85 90 95

Ser Leu Leu Lys Gln His Met Asp Leu Leu Lys Ala Ala Val Phe Pro  
 100 105 110

Leu Arg His Pro Leu Ile Asp Gln Asn Ser Leu Phe Lys Lys Asp Gly  
 115 120 125

Asp

&lt;210&gt; 39

&lt;211&gt; 129

&lt;212&gt; PRT

&lt;213&gt; Lyssavirus sp.

&lt;220&gt;

&lt;223&gt; Mok1SAF

&lt;400&gt; 39

Cys Leu Asp Thr Leu Glu Thr Val Phe Met Ser Gln Ser Val Ser Phe  
 1 5 10 15

Arg Arg Leu Ser His Phe Arg Lys Leu Val Pro Gly Tyr Gly Lys Ala  
 20 25 30

Tyr Thr Ile Leu Asn Gly Ser Leu Met Glu Ala Asn Val Tyr Tyr Lys  
 35 40 45

Arg Val Asp Arg Trp Ala Asp Ile Leu Pro Ser Lys Gly Cys Leu Lys  
 50 55 60

Val Gly Gln Gln Cys Met Asp Pro Val Asn Gly Val Leu Phe Asn Gly  
 65 70 75 80

Ile Ile Lys Gly Pro Asp Gly Gln Ile Leu Ile Pro Glu Met Gln Ser  
 85 90 95

Glu Gln Leu Lys Gln His Met Asp Leu Leu Lys Ala Ala Val Phe Pro  
                   100                  105                  110

Leu Arg His Pro Leu Ile Ser Gln Glu Ala Val Phe Lys Lys Asp Gly  
           115                  120                  125

Asp

<210> 40  
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<400> 40

Met Xaa Leu Gln Ala Val Ile Phe Xaa Leu Leu Xaa Xaa Xaa Leu

1

5

10

15

Cys Leu Gly Lys Phe Pro Ile Tyr Thr Ile Pro Asp Lys Leu Gly Pro

20

25

30

Trp Ser Pro Ile Asp Ile His His Leu Ser Cys Pro Asn Asn Leu Val  
 35 40 45  
 Val Glu Asp Glu Gly Cys Thr Thr Leu Xaa Pro Phe Ser Tyr Met Glu  
 50 55 60  
 Leu Lys Val Gly Tyr Ile Thr Thr Ile Lys Val Ser Gly Phe Thr Cys  
 65 70 75 80  
 Thr Gly Val Val Thr Glu Ala Glu Thr Tyr Thr Asn Phe Val Gly Tyr  
 85 90 95  
 Val Thr Thr Thr Phe Lys Arg Lys His Phe Arg Pro Thr Val Xaa Ala  
 100 105 110  
 Cys Arg Asp Ala Tyr Asn Trp Lys Ile Ala Gly Asp Pro Arg Tyr Glu  
 115 120 125  
 Glu Ser Leu His Asn Pro Tyr Pro Asp Ser His Trp Leu Arg Thr Val  
 130 135 140  
 Thr Thr Thr Lys Glu Ser Leu Leu Ile Ile Ser Pro Ser Val Val Asp  
 145 150 155 160  
 Met Asp Ala Tyr Asp Lys Thr Leu His Ser Lys Met Phe Pro Asn Gly  
 165 170 175  
 Lys Cys Ser Gly Xaa Ser Pro Ser Ser Pro Phe Cys Xaa Thr Asn His  
 180 185 190  
 Asp Tyr Thr Ile Trp Met Pro Glu Asn Pro Asn Pro Gly Leu Ser Cys  
 195 200 205  
 Asp Ile Phe Thr Thr Ser Lys Gly Lys Lys Ala Thr Lys Gly Gly Arg  
 210 215 220  
 Leu Cys Gly Phe Val Asp Glu Arg Gly Leu Tyr Lys Ser Leu Lys Gly  
 225 230 235 240  
 Ala Cys Lys Leu Lys Leu Cys Gly Ile Pro Gly Leu Arg Leu Met Asp  
 245 250 255  
 Gly Ser Trp Val Ser Xaa Gln Xaa Xaa Glu Xaa Xaa Lys Trp Cys Ser  
 260 265 270  
 Pro Asp Gln Leu Val Asn Ile His Asp Phe His Ser Asp Glu Ile Glu  
 275 280 285  
 His Leu Ile Val Glu Glu Leu Val Lys Lys Arg Glu Glu Cys Leu Asp  
 290 295 300  
 Ala Leu Glu Thr Ile Xaa Thr Thr Lys Ser Ile Ser Phe Arg Arg Leu  
 305 310 315 320  
 Ser His Leu Arg Lys Leu Val Pro Gly Phe Gly Lys Ala Tyr Thr Ile  
 325 330 335

Ile Asn Lys Thr Leu Met Glu Ala Asp Ala His Tyr Lys Ser Val Arg  
 340 345 350  
 Glu Trp Xaa Glu Ile Ile Pro Ser Lys Gly Cys Leu Lys Ala Gly Gly  
 355 360 365  
 Arg Cys His Pro His Xaa Asn Gly Val Phe Phe Asn Gly Ile Ile Leu  
 370 375 380  
 Gly Pro Asp Gly His Val Leu Ile Pro Glu Met Gln Ser Ala Leu Leu  
 385 390 395 400  
 Gln Gln His Ile Glu Leu Leu Glu Ser Ser Val Ile Pro Leu Arg His  
 405 410 415  
 Pro Leu Ala Asp Pro Ser Thr Val Phe Lys Lys Asp Asp Glu Ala Glu  
 420 425 430  
 Asp Phe Val Glu Val His Leu Pro Asp Val Gln Lys Xaa Ile Ser Gly  
 435 440 445  
 Ile Asp Leu Gly Leu Pro Glu Trp Lys Arg Tyr Phe Leu Ile Gly Ala  
 450 455 460  
 Ser Ala Leu Ala Leu Leu Ala Leu Ala Ile Ile Ile Ala Val Cys Cys  
 465 470 475 480  
 Lys Arg Val Lys Arg Arg Arg Xaa Xaa Lys Pro Asn Pro Xaa Glu Leu  
 485 490 495  
 Ile Arg Lys Val Ser Val Thr Ser Gln Ser Gly Lys Val Ile Pro Ser  
 500 505 510  
 Trp Glu Ser Tyr Lys Xaa Gly Thr Xaa Gly  
 515 520